

## Agriculture and Natural Resources Sector

### Sector Strategy Update: June 2024

Prepared by the Agriculture and Natural Resources Center of Excellence

**Please describe the greatest workforce needs facing your sector, with a focus on needs that career connected learning strategies can help to address. (2 pages max)**

In the diverse sectors of agriculture and natural resources in Washington state, several workforce needs stand out as significant. These needs are multifaceted, requiring a skilled workforce equipped to tackle emerging challenges in agriculture and natural resources management, such as climate change adaptation, food security and nutrition, and forest health and restoration. Career-connected learning strategies have an opportunity to offer promising pathways to address these needs effectively.

One prominent workforce need in Washington state's agricultural sector lies within plant and soil science. Professionals proficient in crop production, soil fertility management, and sustainable and/or regenerative agriculture techniques are essential to optimize yields while minimizing environmental impact. With the state's diverse agricultural landscape ranging from orchards and vineyards to row crops and specialty crops, there's a demand for individuals with specialized knowledge in crop management practices tailored to these unique systems. Career-connected learning strategies can play a pivotal role in meeting this need by providing students with hands-on training in agricultural practices, soil health assessment, precision farming technologies, and sustainable crop management strategies. Internships, in-class curriculum, and industry partnerships offer opportunities for students to gain practical experience and develop the skills needed to address the complex challenges facing modern agriculture.

In forestry, there's a growing need for forest managers, conservationists, and researchers who can address challenges related to wildfire management, forest health, ecosystem restoration, and timber production while ensuring long-term ecological and economic sustainability. With Washington state's vast forested landscapes encompassing diverse ecosystems ranging from temperate rainforests to dry pine forests, there's a demand for professionals who understand the complexities of forest ecosystems and can implement sustainable management practices. Career-connected learning strategies can provide opportunities for students to gain practical experience in forest management through internships, fieldwork, and research projects. By collaborating with forestry agencies, conservation organizations, and industry partners, students can develop the skills and knowledge needed to address the pressing challenges facing Washington state's forests, such as wildfire prevention and mitigation, invasive species management, and ecosystem restoration.

Similarly, in the field of animal science, there is a significant demand for professionals skilled in animal health, breeding and genetics, and livestock management to ensure the sustainability and productivity of the livestock industry. Washington state boasts a diverse livestock sector, including dairy, beef, poultry, and specialty animal production. However, the industry faces challenges such as disease management, genetic improvement, and animal welfare concerns. Career-connected learning initiatives can help bridge the gap between classroom education and real-world application by providing students with opportunities to engage in experiential learning activities, such as internships on farms or research facilities, site visits to feedlots and dairies, and mobile labs that can come to the class. By gaining practical experience in animal husbandry,

health monitoring, and production management, students can develop the skills and expertise needed to address the complex needs of the livestock industry in Washington state. New contacts have recently engaged ANR as Sector Lead, opening up conversations about conservation science and fisheries. As Washington state continues to prioritize a green economy and long-term ecological health, these connections are increasingly critical. We're looking forward to engaging this new subsector and the industry partners associated with these roles to broaden our current scope within agriculture and natural resources as a whole.

Overall, career-connected learning strategies have the ability to play a crucial role in addressing the greatest workforce needs in Washington state's agriculture and natural resources sectors. By providing students with hands-on training, experiential learning opportunities, and industry connections, these strategies can cultivate a skilled workforce capable of addressing complex challenges while related to agriculture and natural resources.

**Between now and June of 2025, what are your sector's 3-6 occupations that are highest-priority for building supportive career connected learning pathways? Please focus on occupations that lead to economic self-sufficiency.**

- Plant & Soil Science
- Forestry
- Animal Science

**For each of the occupations identified above, please provide the information below to help inform pathway development efforts and investments.**

<p><b>Occupation:</b></p> <ul style="list-style-type: none"> <li>● Farm Worker (\$42,000)</li> <li>● Agronomist/Field Consultant/Ag Sales Rep (\$79,400 – \$92,600)</li> </ul>	<p><b>Sub-sector:</b></p> <p>Agriculture - Plant &amp; Soil Science</p>
<p><b>Average wage:</b> \$42,000 - \$92,600 (\$71,333 avg)</p>	
<p><b>Which skills/competencies do employers use as a benchmark to hire someone in this occupation?</b></p> <ul style="list-style-type: none"> <li>● Knowledge of agricultural products, equipment, and services</li> <li>● Understanding of sales techniques and strategies</li> <li>● Customer relationship management skills</li> </ul>	<p><b>Which credentials do employers cite as a valuable benchmark to hire someone in this occupation?</b></p> <ul style="list-style-type: none"> <li>● Certified Crop Advisor (CCA)</li> <li>● Commercial Driver's License (CDL)</li> </ul>

- Product knowledge and the ability to explain features and benefits to customers
- Technical knowledge of agricultural equipment, machinery, and systems
- Ability to perform maintenance, repairs, and adjustments on farm equipment
- Familiarity with computerized systems and diagnostic tools
- Ability to interpret soil and crop data and make recommendations
- Deep understanding of crop biology, cultivation practices, and pest management
- Knowledge of soil science, irrigation systems, and environmental factors influencing crop growth
- Ability to plan and manage crop production cycles from planting to harvest
- Ability to collect and analyze vineyard data for decision-making
- Comprehensive understanding of crop physiology, soil science, and agronomic principles
- Problem-solving abilities for addressing agronomic challenges and optimizing crop production

- Certified Pesticide Applicator
- Associate degree or certificate in Agricultural Technology, Agricultural Mechanics, or related field
- Bachelor's degree in Agriculture, Agribusiness, Farm Management, or related field
- Bachelor's degree in Agronomy, Crop Science, Soil Science, or related field
- Bachelor's degree in Horticulture, Plant Science, Agronomy, or related field
- Bachelor's or Master's degree in Agronomy, Crop Science, Soil Science, or related field (advanced degree preferred for research or leadership roles)

**Please describe possible career progression opportunities for this occupation:**

Career progression opportunities for farm workers are diverse. Starting as a general farm laborer, individuals can gain foundational skills and experience in various farm tasks such as planting, harvesting, and animal care. As they develop expertise in specific areas, they may transition to become specialized workers, taking on roles such as equipment operators or irrigation specialists, where they contribute specialized knowledge and skills to farm operations. Progressing further, they may advance to become a lead farm worker, assuming a leadership role within their team and coordinating daily activities.

An experienced farm worker may step into a supervisory position, where they oversee the work of other farm workers, ensure tasks are completed efficiently, and maintain quality standards. With accumulated experience and demonstrated leadership abilities, an individual can rise to the position of farm manager, where they hold responsibility for the overall management and success of the farm, including crop production, livestock management, and financial performance.

Beyond farm management, career progression may lead individuals to roles such as ranch manager, where they oversee larger agricultural properties with diverse operations, including livestock grazing and land management.

Career progression opportunities for agronomists offer a structured path with increasing levels of responsibility and leadership. Entry-level agronomist positions focus on soil management, crop production, and pest control. As agronomists gain experience and expertise in their field, they may take on more specialized roles in research, or precision agriculture. Progressing further, they may attain the title of senior agronomist, leading research projects, providing technical guidance, and contributing to industry advancements. Advancement to roles such as research agronomist or agronomy manager involves overseeing research initiatives, developing innovative agronomic solutions, and managing a team.

Ultimately, individuals may reach executive-level positions such as chief agronomist, where they provide strategic direction and leadership in shaping agronomic practices and policies within organizations or the broader agricultural community.

**Please share the data, employer feedback, and/or Regional Network feedback that helped you identify this as a high-priority occupation:**

Farmworkers and agronomists/field consultants are in critical demand in Washington State due to several factors gleaned from employer feedback. In convenings and one-on-one interviews with employers, they emphasized the critical need for positions such as crop advisors, agronomists, farmworkers, and truck drivers. These roles are pivotal in ensuring the smooth functioning and productivity of agricultural operations statewide. Moreover, within these positions, there are opportunities for career advancement, with employers noting that employees often have the chance to transition between departments.

Discussions with both the Northwest and Mid-Columbia Regional Networks have underscored the necessity to prioritize agricultural occupations. These conversations have emphasized the importance of directing attention and resources towards addressing the needs and challenges within the agricultural sector. This focus reflects the recognition of the critical role that agriculture plays in the regional economy and the significance of supporting workforce development efforts within this industry.

**Please describe the top barriers employers have identified to hiring for this occupation:**

Through conversations and employer participation in our workforce and career connected learning surveys, employers have identified some barriers to hiring for both farm workers and agronomists. For farm workers, one of the primary challenges is the seasonal nature of agricultural work, which can make it difficult to attract and retain workers for short-term employment periods. Limited access to affordable housing in rural areas further complicates recruitment efforts, which is a concern that comes up often in communication with employers and pain points when it comes to hiring.

In the case of agronomists, employers encounter barriers related to education and training. There is a lack of individuals with knowledge and/or experience related to agronomy, horticulture, and plant and soil sciences, resulting in a limited pool of qualified candidates for agronomist positions.

**Please describe the type of programs or approaches employers have found helpful in hiring for this occupation:**

Employers have identified several beneficial programs and approaches for hiring in the fields of agronomy, field consulting, and agricultural sales. These programs commonly involve post-secondary education, offering avenues such as two-year degree paths from community colleges and four-year degree programs available at both community colleges and universities. Additionally, employers often support their hired personnel by sponsoring additional certifications, including the Certified Crop Advisor (CCA), Commercial Driver's License (CDL), and Certified Pesticide Applicator.

In the realm of hiring farmworkers, employers utilize diverse strategies to ensure efficiency. One prevalent method is leveraging word of mouth and employee referrals, where existing staff recommend potential candidates from their personal networks. Moreover, some employers collaborate with labor contractors or specialized staffing agencies focused on agricultural labor to streamline the recruitment process. These contractors typically boast extensive candidate networks, enhancing the efficiency of hiring efforts. In cases of local labor shortages, employers may opt for temporary foreign worker programs like the H-2A visa program to fulfill seasonal agricultural positions. Additionally, employers may

offer on-the-job training or apprenticeship programs to individuals with limited agricultural experience, providing hands-on learning opportunities to cultivate the necessary skills for farm work.

### **Between now and June of 2025, where is there regional momentum to support pathway development in this occupation?**

For each region listed, please describe:

1. **Key momentum factors** (e.g., interested employers, high-priority for Regional Network, opportunity to improve equitable access, opportunity to scale existing programs, portions of CCW pathway already built)
2. **High-potential opportunities** to support pathway development
3. Is supporting those high-potential opportunities a **shared priority** across SL and RN?

- **Region 1: NORTHWEST**

- **Key Momentum Factors:** In the Northwest region, key momentum factors driving pathway development include the presence of established partners like Sakuma Brothers and Cloud Mountain Farm, with a focus on berries as a significant agricultural product in the region. Cloud Mountain Farms was awarded a program builder grant to pilot their new program, Agricultural Career Exploration in Whatcom (ACE – Whatcom). Additionally, ongoing initiatives such as the 5G project on farms and the presence of the Northwest Agriculture Business Center contribute to the momentum in the region.
- **High-Potential Opportunities:** High-potential opportunities in the Northwest region include strengthening partnerships with existing partners like United Farm Workers and potential new college programs to support workforce development in the agricultural sector. There's also potential for marketing initiatives to promote employment opportunities, particularly for smaller farms. Exploring initiatives like the 5G project for innovative solutions in agriculture are identified as promising pathways for pathway development in the region.
- **Shared Priority:** Supporting these high-potential opportunities emerges as a shared priority across both the Sector Leader and Regional Network in the region. There is a high degree of alignment in recognizing the significance of these opportunities for advancing workforce development and pathway development efforts in the agricultural sector. Further discussion is desired to delve deeper into specific strategies and action plans to capitalize on these opportunities. Given the alignment between SL and RN, it's essential to facilitate discussions among relevant stakeholders to explore these opportunities in greater detail.

- **Region 2: MID-COLUMBIA**

- **Key Momentum Factors:** In the Mid-Columbia region, several key momentum factors are propelling pathway development. Notably, the Tri-Cities Career STEM Academy serves as a significant driver, focusing on a blend of regional energy and agricultural careers to provide pathway guidance for high school students. This initiative underscores the region's commitment to preparing the next generation for careers in vital sectors. Additionally, there is interest in Career explore and prep programming, with a particular focus on clean energy initiatives where there is opportunity for the agriculture sector to collaborate. The Clean Tech Sector Leader has been brought into the loop regarding this initiative and is actively backing these endeavors statewide, spanning Wenatchee, Tri-Cities, and Centralia. This emphasis reflects the region's awareness of emerging workforce needs and its proactive approach to addressing them.

- **High-Potential Opportunities:** High-potential opportunities to support pathway development in the Mid-Columbia region include collaborating with Educational Service District (ESD) 123 to enhance Career Connected learning program development efforts, particularly in expanding pathways for high school students. Reapplying for Regional Challenge Grant funding with ESD 123 as a partner offers a significant opportunity to invest in the formation and growth of cross-sector partnerships committed to increasing educational attainment in the Mid-Columbia region. Additionally, connecting with the Washington Department of Agriculture (WSDA) opens doors for potential partnerships and collaborations that can enrich pathway offerings.
- **Shared Priority:** Supporting these high-potential opportunities emerges as a shared priority across both the Sector Leader (SL) and Regional Network (RN) in the Mid-Columbia region. There is a high degree of alignment in recognizing the significance of these opportunities for advancing pathway development efforts and fostering collaboration between stakeholders. We will continue to collaborate and support the regional network in their ongoing efforts for pathway development in the Mid-Columbia region.

<p><b>Occupation:</b> Forest Technician - Forester (\$48,800 - \$82,100) Conservation Technician – Conservation Scientist (\$48,800 - \$87,400)</p>	<p><b>Sub-sector:</b> Forestry</p>
<p><b>Average wage:</b> \$48,800 - \$87,400 (\$72,766 avg)</p>	
<p><b>Which skills/competencies do employers use as a benchmark to hire someone in this occupation?</b></p> <ul style="list-style-type: none"> <li>● Ability to conduct forest inventories, assessments, and management planning</li> <li>● Proficiency in forest measurement techniques and data analysis</li> <li>● Knowledge of tree species identification, silviculture, and forest ecology</li> <li>● Project management skills</li> <li>● Understanding of forest economics, timber markets, and sustainable forest management practices</li> <li>● Ability to use Geographic Information Systems (GIS) and other forestry software for mapping and analysis</li> <li>● Ability to operate and maintain forestry tools and equipment safely</li> <li>● Experience in habitat restoration, land management, or conservation projects</li> <li>● Understanding of native plant species identification, invasive species management, and habitat requirements</li> </ul>	<p><b>Which credentials do employers cite as a valuable benchmark to hire someone in this occupation?</b></p> <ul style="list-style-type: none"> <li>● Bachelor's or Master's degree in Forestry, Natural Resources Management, or related field</li> <li>● Professional certification as a Registered Forester (e.g., Society of American Foresters Certified Forester)</li> <li>● Certification in GIS (Geographic Information Systems) or proficiency in GIS software</li> <li>● Associate degree or certificate in Forestry Technology, Natural Resources Management, or related field</li> <li>● Associate degree or certificate in Conservation Technology, Environmental Science, or related field</li> </ul>

- Expertise in conservation biology, ecosystem management, or natural resource management
- Ability to assess environmental impacts and develop conservation strategies
- Knowledge of regulatory frameworks and policies related to conservation and environmental protection
- Understanding of climate change impacts on forest ecosystems and resilience strategies

- Certification in pesticide application or herbicide use (if applicable)
- Master's or Ph.D. degree in Conservation Science, Ecology, Environmental Science, or related field
- Bachelor's or Master's degree in Forestry, Plant Pathology, Entomology, or related field

**Please describe possible career progression opportunities for this occupation:**

One possible career progression is from Forest Technician to Forester. Initially, individuals may start as entry-level forest technicians undergoing training to acquire practical skills and hands-on experience in forest management tasks. As they gain proficiency, they advance to the role of senior level forest technician, where they engage in various forestry operations like tree planting, timber harvesting, forest inventory, and disease and pest identification. Transitioning into the forester track, they may become an entry level forester, assuming more specialized roles assisting more senior level foresters with data collection, analysis, and project coordination. With accumulated experience and further education, they progress to become full-fledged foresters, taking on responsibilities such as managing forest resources, planning timber harvests, and implementing conservation practices. Moving up the ladder, they may then become lead foresters, overseeing teams and managing larger projects, or forestry managers, responsible for overall forest management operations including budgeting and strategic planning. Additionally, alternative paths within forestry offer diverse career opportunities. As lead forest technicians, individuals assume leadership roles within technician teams, supervising and coordinating field operations. Forest management specialists specialize in specific areas like wildlife management, forest ecology, or GIS analysis, providing expertise in these areas. Field operations managers are tasked with managing day-to-day field operations, ensuring projects are completed efficiently and safely. Forest resource managers focus on sustainable forest resource management, often working for government agencies or large landowners. Furthermore, forestry consultants provide specialized expertise and advisory services on various aspects of forest management, catering to private landowners, government agencies, or forestry companies. Advancement in each career stage may require additional education, certifications, and experience. Individuals have the flexibility to specialize in specific areas of forestry aligned with their interests and career goals. Networking, continuing education, and gaining practical experience are vital for career progression in the forestry field.

Another career progression opportunity is that of a conservation technician. Starting as a conservation worker, individuals gain initial experience and practical skills in conservation practices. As they develop proficiency, they move into the role of a conservation technician, where they engage in more specialized tasks related to conservation efforts. Progressing further, they may become lead conservation technicians, taking on leadership responsibilities within their team and overseeing conservation projects. Advancing to the position of conservation specialist, they specialize in specific areas of conservation, applying their expertise to address environmental challenges effectively. With accumulated experience and additional education, individuals can transition into roles such as conservation managers, where they are responsible for planning and implementing conservation initiatives on a larger scale.

On the other hand, the career path for conservation scientists starts with entry-level positions, where individuals begin conducting research and analysis related to conservation issues. As they gain experience and expertise in the field, they advance to become conservation scientists, leading research projects and contributing valuable insights to conservation efforts. Progressing further, they may attain the title of senior conservation scientist, taking on more significant responsibilities and providing guidance to junior scientists. With continued dedication to research and professional development, they may transition into roles such as research scientists, focusing on advancing scientific knowledge in conservation biology and ecology. Further career progression may lead them to positions like conservation program director, where they oversee the development and implementation of conservation programs, or chief conservation scientist, assuming leadership roles in shaping conservation strategies and policies.

Each stage of career progression requires dedication, continuous learning, and a commitment to making a positive impact on environmental conservation. Individuals have the opportunity to specialize in specific areas of conservation based on their interests and expertise, contributing to the protection and preservation of natural resources for future generations.

**Please share the data, employer feedback, and/or Regional Network feedback that helped you identify this as a high-priority occupation:**

Foresters and conservation scientists are of critical demand to the state of Washington due to several key factors outlined in employer feedback. Firstly, there is a clear need for individuals with technical expertise and diverse knowledge in forestry, habitat restoration, and environmental conservation. These roles require a passion for the work and an understanding of specialized areas such as forest health, pest management, and conservation planning.

Anticipating future labor needs, employers acknowledge the increasing demand for technology skills and the importance of adapting to changing technologies. While automation is seen as supportive, human labor remains essential, particularly in roles requiring nuanced decision-making and environmental stewardship. Additionally, there is a growing emphasis on climate resilience, environmental conservation, wildfire management, and sustainable practices, highlighting the need for a workforce ready to address these evolving challenges.

Employers express a desire to diversify the workforce and engage with BIPOC communities through intentional programs and initiatives. By encouraging exposure to industry-related work early in education and offering internships and site tours, employers aim to inspire the next generation of foresters and conservation scientists and address the ongoing challenges of recruitment and retention in the field.

Discussions with both the East and North Central Regional Networks have highlighted the importance of prioritizing forestry occupations. Feedback from the North Central region points out the significant role of tribes as major employers in Okanogan County, particularly in the fields of fisheries and natural resources. This underscores the critical need for skilled professionals in forestry-related roles. Similarly, the Eastern Regional Network has expressed an interest in supporting tribal engagement within the forestry sector. Additionally, they aim to maximize the utilization of existing local programs, including degree and certificate programs, to enhance workforce development efforts. This collaborative approach emphasizes the importance of recognizing and addressing the unique needs and opportunities within the forestry sector across different regions, with a particular focus on fostering partnerships with tribal communities and leveraging existing educational resources.

**Please describe the top barriers employers have identified to hiring for this occupation:**

In Washington state's forestry industry, there are a few barriers that can impede hiring. One significant challenge is the lack of qualified candidates with appropriate education and experience. Moreover, the industry faces difficulties in attracting young professionals due to perceptions of forestry as physically demanding work without sufficient advancement prospects. Additionally, competition from other industries can be a factor. Rural locations of many forestry operations in Washington pose challenges in attracting and retaining talent, especially for those accustomed to urban living and the ease of access to amenities like entertainment and dining. Addressing these barriers requires concerted efforts to enhance education and training opportunities, improve industry perception, and offer competitive compensation and benefits packages to attract and retain skilled professionals in the forestry sector.

**Please describe the type of programs or approaches employers have found helpful in hiring for this occupation:**

Employers have adopted a multifaceted approach to hiring for positions such as forest technicians, foresters, conservation technicians, and conservation scientists. This approach typically combines various programs, prior experience, and on-the-job training. Additionally, employers actively participate in career fairs to attract potential candidates. In many cases, employers seek individuals with a two-year degree or certificate, and they supplement their knowledge with on-the-job training to ensure they possess the necessary skills for the role. For positions like conservation scientists, employers typically recruit from a pool of applicants holding at least a four-year degree. This combination of educational qualifications, hands-on experience, and tailored training programs ensures that individuals hired for these roles are well-equipped to meet the demands and responsibilities of their positions within the forestry and conservation sectors.

**Between now and June of 2025, where is there regional momentum to support pathway development in this occupation?**

*For each region listed, please describe:*

1. **Key momentum factors** (e.g., interested employers, high-priority for Regional Network, opportunity to improve equitable access, opportunity to scale existing programs, portions of CCW pathway already built)
2. **High-potential opportunities** to support pathway development
3. *Is supporting those high-potential opportunities a **shared priority** across SL and RN?*

- Region 1: **EAST**

- **Key Momentum Factors:** In Region 1 (EAST), key momentum factors driving pathway development include the presence of interested employers in the forestry and agriculture sectors and the high-priority designation from the Regional Network due to impending retirements within Career and Technical Education (CTE). Additionally, there's an opportunity to enhance equitable access to Dual Credit programs, with portions of the Community and Technical College (CCW) pathway already established.
- **High-Potential Opportunities:** High-potential opportunities in the East region include focusing on Dual Credit credentialing, with a specific emphasis on expanding college in the high school programs. The successful model implemented by the East Valley School District could serve as a scalable template for other regions. Engaging with Tribal communities to increase participation in agriculture and forestry programs, and addressing the shortage of high school Agriculture Educator graduates and upcoming retirements in CTE through enhanced Ag Education are also identified as important opportunities to focus on.

- **Shared Priority:** Supporting these high-potential opportunities emerges as a shared priority across both the Sector Leader and Regional Network. This alignment indicates a collective commitment to addressing critical workforce development needs and ensuring the success of pathway development efforts in the East region. Areas where the RN and SL identify a shared priority and alignment on potential opportunities include Dual Credit credentialing, scaling up college in the high school programs, Tribal engagement, and strengthening Ag Education. Determining a collaborative model between the RN and SL will be instrumental in effectively supporting and advancing these identified opportunities.
  
- **Region 2: NORTH CENTRAL**
  - **Key Momentum Factors:** In the North Central region, key momentum factors driving pathway development include tribal engagement, particularly in fisheries and natural resources, and Western Washington University’s Sustainability Pathways Program in the Methow and Okanogan Valleys. Both present avenues for advancing pathway development efforts. Moreover, ongoing occupation exploration events targeting 6th to 12th-grade students and college attendees, as well as regular meetings with Career and Technical Education (CTE) directors, contribute to the momentum in the region.
  - **High-Potential Opportunities:** High-Potential opportunities in the North Central region include harnessing tribal involvement to bolster participation natural resources-oriented pathways. This involves initiatives such as the development of a Natural Resource Career Launch program at Nespelem High School, spearheaded by the Colville Confederated Tribes, who received Program Builder Round 11 funding. Additionally, exploring partnerships with Career Launch programs at Western Washington University offers access to valuable resources and support for current pathways. Furthermore, the region’s Occupation Exploration events, facilitated by the North Central Regional Network, serve as platforms to engage with a diverse audience and raise awareness about available pathways. There’s a recognized necessity to update the natural resource curriculum in the area, presenting an opportunity to utilize frameworks provided by the Pacific Education Institute’s (CCW Program Builder) to achieve this goal.
  - **Shared Priority** Supporting these high-potential opportunities emerges as a shared priority across both the Sector Leader (SL) and Regional Network (RN) in the North Central region. There is a high degree of alignment in recognizing the significance of these opportunities for advancing pathway development efforts and fostering collaboration between stakeholders.

<p><b>Occupation:</b></p> <ul style="list-style-type: none"> <li>● Livestock Manager (\$91,100)</li> <li>● Animal Nutrition Specialist (\$95,000)</li> </ul>	<p><b>Sub-sector:</b></p> <p>Agriculture – Animal Science</p>
<p><b>Average wage:</b> \$55,700 - \$95,000 (\$82,850 avg)</p>	

**Which skills/competencies do employers use as a benchmark to hire someone in this occupation?**

- Animal husbandry skills
- Knowledge of livestock nutrition and health
- Ability to manage herd/flock health and reproduction
- Record-keeping and data analysis capabilities
- Understanding of industry regulations and compliance
- Financial analysis and forecasting skills
- Strategic planning and decision-making abilities
- Understanding of livestock production systems and practices
- Knowledge of animal physiology and nutritional requirements
- Understanding of feed ingredients and their nutritional value
- Ability to formulate balanced diets for different livestock species
- Research and analytical skills for evaluating feed options and nutritional strategies
- Problem-solving abilities in addressing nutritional deficiencies and health issues

**Which credentials do employers cite as a valuable benchmark to hire someone in this occupation?**

- Bachelor's degree in Animal Science, Agriculture, or related field
- Certifications in herd health management or livestock production
- Additional certifications in animal husbandry or livestock handling techniques
- Bachelor's degree in Animal Science, Veterinary Technology, or related field
- Bachelor's degree in Agriculture, Agribusiness, Business Administration, or related field
- Advanced degree (Master's or Ph.D.) in Animal Nutrition, Animal Science, or related field

**Please describe possible career progression opportunities for this occupation:**

Career progression opportunities for a livestock manager can follow a structured path within the agricultural industry. Some may begin as a farmhand and gain hands-on experience and foundational knowledge in livestock care, handling, and farm operations. As they develop skills, complete courses or degree programs, and demonstrate the required competencies, they may advance to the role of assistant livestock manager, where they take on more responsibilities and assist in managing day-to-day operations on the farm, ranch, feedlot, or other operation.

Progressing further in their career, individuals may transition into the position of livestock manager, where they oversee all aspects of livestock production, including feeding, breeding, health management, and herd maintenance. In this role, they are responsible for ensuring the well-being and productivity of the livestock while also managing staff, budgets, and farm resources.

Advancing to the position of livestock operations manager, individuals take on broader responsibilities, overseeing multiple aspects of livestock production. They may be involved in strategic planning, implementing best practices, and optimizing operations to maximize efficiency and profitability. Throughout their career, individuals may have opportunities for professional development, such as attending training programs and acquiring certifications.

Career progression opportunities for an animal nutrition specialist may begin as an entry-level nutritionist where individuals gain foundational knowledge and practical experience in formulating animal diets, assessing nutritional needs, and analyzing feed quality. As they develop expertise and proficiency, they may advance to become animal nutritionists, where they specialize in designing customized feeding programs for various species of livestock or companion animals.

Progressing further in their career, individuals may attain the position of senior animal nutritionist, where they assume leadership roles within their organizations, mentor junior staff, and provide specialized expertise in addressing complex nutritional challenges. With a focus on research and innovation, some may transition into roles such as nutrition research scientists, conducting studies to advance understanding of animal nutrition, develop new feed additives, or optimize feeding strategies for improved animal health and performance.

At the pinnacle of their career, individuals may reach the position of chief animal nutritionist, where they provide strategic direction and leadership in shaping the nutritional policies, standards, and practices within their organizations or the broader animal agriculture industry. They may also engage in advocacy efforts, knowledge dissemination, and professional development initiatives to promote advancements in animal nutrition science and practice.

**Please share the data, employer feedback, and/or Regional Network feedback that helped you identify this as a high-priority occupation:**

Feedback and input regarding these occupations stem from anecdotal evidence gathered through a variety of channels, including formal and informal discussions with employers, as well as insights gleaned from the ongoing work of the Agriculture and Natural Resource Center of Excellence. Livestock managers and animal nutritionists are indispensable pillars of Washington's agriculture sector, despite the potential variability in the number of positions available at any given time. While the demand for these roles may not always result in a large number of open positions simultaneously, their importance remains critical. Livestock managers are tasked with the day-to-day oversight of animal care, ensuring their well-being, health, and productivity. Their expertise maximizes operational efficiency on farms, covering various aspects from breeding to health monitoring. In a state boasting diverse livestock species such as dairy cows, beef cattle, and poultry, the nuanced understanding of animal needs is paramount. Similarly, animal nutritionists play a pivotal role in formulating tailored diets and feeding regimes to meet the nutritional demands of different livestock. By optimizing nutrition, they support animal health, growth, and reproduction while minimizing feed costs. Their contribution to livestock health, growth, and environmental sustainability remains constant. They address concerns like reducing methane emissions and mitigating nutrient runoff. In supporting the viability and profitability of livestock operations, these professionals bolster Washington's agricultural economy and rural communities. Overall, their expertise is essential for ensuring the sustainable and efficient production of livestock, thus contributing to food security, economic prosperity, and environmental stewardship in the state.

**Please describe the top barriers employers have identified to hiring for this occupation:**

Employers encountering challenges in hiring for occupations like animal nutrition specialists and livestock managers often face a few barriers. Among these barriers is the skills gap between the requirements of the position and the available skill sets of potential candidates. Specifically, expertise in animal nutrition science, encompassing feed formulation, dietary needs for various species, and understanding of nutritional deficiencies. Additionally, meeting educational prerequisites poses a hurdle, as these roles typically demand degrees in animal science, agriculture, or closely related fields. Securing candidates with the necessary experience in practical livestock management, feed program administration, or animal nutrition research is also a common obstacle. Furthermore, fierce competition within the agricultural and animal husbandry industries for qualified talent can impede recruitment efforts. Geographical constraints, particularly for positions situated in remote or rural areas, may deter potential candidates due to relocation concerns.

**Please describe the type of programs or approaches employers have found helpful in hiring for this occupation:**

Training programs catering to livestock managers and animal nutritionists predominantly encompass conventional pathways of post-secondary education. These paths consist of two-year degree options available at community colleges, along with four-year degree programs offered by universities. Additionally, employers actively participate in various events and outreach endeavors. These include career fairs, networking sessions held at colleges, and ongoing communication with program faculty regarding industry trends and hiring requirements.

**Between now and June of 2025, where is there regional momentum to support pathway development in this occupation?**

*For each region listed, please describe:*

1. **Key momentum factors** (e.g., interested employers, high-priority for Regional Network, opportunity to improve equitable access, opportunity to scale existing programs, portions of CCW pathway already built)
2. **High-potential opportunities** to support pathway development
3. *Is supporting those high-potential opportunities a **shared priority** across SL and RN?*

- **Key Momentum Factors:** Livestock management and animal nutritionist roles are vital components of Washington's agricultural sector. While specific regions for momentum have not been identified yet, we believe in the potential of the career connected learning continuum to support existing programs and enhance pathway development in the agriculture sector. The nuanced understanding of animal physiology, feed formulation, and industry regulations are critical momentum factors driving pathway development.
- **High-Potential Opportunities to Support Pathway Development:** Existing programs such as the Washington State University Certificate & Degree Options in Animal Science offer valuable pathways for careers in livestock management and animal nutrition already and have the potential for career launch. Furthermore, partnerships with community colleges like Walla Walla Community College provide accessible post-secondary options tailored to meet the educational requirements of these occupations. At the high school level, many schools across the state offer animal science as one of the agriculture class options. There is an opportunity in the K-12 system to enhance those offerings into more developed pathways to higher education and beyond. By leveraging these programs and fostering collaborations with education partners and industry stakeholders, we can effectively support pathway development initiatives and address the workforce needs in livestock management and animal nutrition.

**For each region below, which workforce education & training programs are *effectively* meeting employer needs, or could effectively meet their needs with adjustment or expanded capacity? Where relevant, please color code responses to reflect their relevance to specific occupations.**

**Please provide your color coding key below:**

**Farm Worker**

**Agronomist/Field Consultant/Ag Sales Rep**

**Forest Technician - Forester**

## Conservation Technician – Conservation Scientist

### Livestock Manager

### Animal Nutrition Specialist

\*Roles with an asterisk apply to more than one occupation.

<p><b>Capital</b></p>	<ul style="list-style-type: none"> <li>● <b>GRuB – GroundEd</b></li> <li>● <b>*Grays Harbor College Certificate &amp; Degree Options: Forest Resource Mgmt Grays Harbor College Certificate &amp; Degree Options: Natural Resources - Forestry Technician</b></li> </ul>
<p><b>East</b></p>	<ul style="list-style-type: none"> <li>● <b>Spokane Community College Certificate &amp; Degree Options: Agriculture Technology, Small Farm Production, Spray Technician</b></li> <li>● <b>Big Bend Community College Certificate &amp; Degree Options: Agriculture Agronomy, Agricultural Systems*, Agriculture Technology and Mgmt, Agriculture Technology and Production Mgmt, Field Crop Mgmt.</b></li> <li>● <b>Washington State University: Field Crop Management, Agriculture Technology and Production management</b></li> <li>● <b>Big Bend Community College – Agriculture Technology &amp; Management: CTC Program</b></li> <li>● <b>Spokane Community College Certificate &amp; Degree Options: Arboriculture &amp; Urban Forestry - Natural Resource Mgmt. - Forestry Technician</b></li> <li>● <b>Spokane Community College Certificate &amp; Degree Options: Natural Resource Technologies in GIS, Natural Resources - Parks &amp; Recreation, Water Resource Technology, Water Resources Technologies in GIS</b></li> <li>● <b>Washington State University - Bachelors of Science degree in Earth and Environmental Science, Degree Options: Earth Science, Environmental and Ecosystem Sciences, Forest Ecology and Management, Wildlife Ecology and Conservation Sciences</b></li> <li>● <b>*Washington State University Certificate &amp; Degree Options: Bachelor’s of Science – Animal Science, Bachelor’s of Science – Pre Veterinary Medicine, Master’s of Science – Animal Science, Doctor of Philosophy – Animal Science, Doctor of Veterinary Medicine</b></li> </ul>
<p><b>King &amp; Pierce</b></p>	<ul style="list-style-type: none"> <li>● <b>Green River College – Forestry: CTC Program</b></li> <li>● <b>*Green River College: Certificate &amp; Degree Options: Natural Resources - Forest Resource Mgmt.* Track One: Sampling and Assessment Track Two: Forestry Operations</b></li> <li>● <b>Green River College Certificate &amp; Degree Options: Natural Resources, Natural Resources – GIS, Natural Resources – Park Mgmt, Natural Resources – Water Quality, Natural Resources – Wildland</b></li> <li>● <b>University of Washington - Environmental Science and Terrestrial Resource Management (ESRM) Major Options: ESRM degree: General</b> <ul style="list-style-type: none"> <li>○ <b>ESRM degree: Option in Natural Resources and Environmental Management</b></li> <li>○ <b>ESRM degree: Option in Restoration Ecology and Environmental Horticulture</b></li> <li>○ <b>ESRM degree: Option in Sustainable Forest Management</b></li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ <b>ESRM degree: Option in Wildlife Conservation</b></li> <li>● <b>YESS Program</b></li> </ul>
<b>Mid-Columbia</b>	<ul style="list-style-type: none"> <li>● <b>*ESD 123 – High School to Highway CDL</b></li> <li>● <b>Columbia Basin Community College – Agriculture Production: CTC Program</b></li> <li>● <b>Walla Walla Community College Certificate &amp; Degree Options: Agriculture Education, Agriculture - Plant &amp; Soil Science, Agricultural Systems*, Agriculture Technology &amp; Mgmt, Field Crop Mgmt, Food Science, Organic &amp; Sustainable Agriculture, Viticulture Science</b></li> <li>● <b>Columbia Basin College Certificate &amp; Degree Options: Agriculture Systems*, Crop &amp; Soil Science, Field Crop Management, Precision Agriculture</b></li> <li>● <b>Walla Walla Community College Certificates &amp; Degrees: Forest Ecology &amp; Mgmt</b></li> <li>● <b>Walla Walla Community College Certificates &amp; Degree Options Wildlife Ecology &amp; Conservation, Earth Sciences, Environmental &amp; Ecosystem Sciences</b></li> <li>● <b>*Walla Walla Community College Certificate &amp; Degree Options: Animal Science - Animal Mgmt, Pre-Veterinary Medicine</b></li> <li>● <b>Walla Walla Public Schools – 3<sup>rd</sup> &amp; 4<sup>th</sup> Grade Farm Experience</b></li> <li>● <b>Walla Walla County Conservation District – Wheat Week</b></li> <li>● <b>PNNL &amp; Benton Conservation District – Salmon Summit</b></li> </ul>
<b>North Central</b>	<ul style="list-style-type: none"> <li>● <b>Wenatchee Valley College Certificate &amp; Degree Options: Hispanic Orchard Employee Education, Horticulture &amp; Tree Fruit, Integrated Pest Mgmt, Sustainable &amp; Organic Ag, Viticulture Sustainability</b></li> <li>● <b>Western Washington University – Sustainability Pathways Program (Twisp, WA location)</b></li> <li>● <b>*Wenatchee Valley College Certificate &amp; Degree Options: Natural Resources</b></li> </ul>
<b>Northwest</b>	<ul style="list-style-type: none"> <li>● <b>Whatcomb – ACE Program</b></li> </ul>
<b>South Central</b>	<ul style="list-style-type: none"> <li>● <b>Yakima Valley College Certificate &amp; Degree Options: Production/Pest Mgmt, Tree Fruit Production</b></li> </ul>

**What is needed to increase participation of BIPOC students in your sector's high priority occupations? To increase participation of students from rural areas? Which programs are doing this well? (2 pages max)**

To increase participation of BIPOC students and students from rural areas in our sector's high priority occupations, it's essential to focus on exposure, access, and support.

**1. Exposure Opportunities for Urban and Rural Learners:**

- Implement career exploration and preparation opportunities tailored to both urban and rural learners. This includes initiatives such as career fairs, industry site tours, in-class curriculum, and informational sessions hosted in urban centers and rural communities alike. It is important to tailor these opportunities to speak to the experiences of students from both types of areas. Rural students may need to see the breadth of opportunities in their home regions, and urban students might benefit from exposure to the lifestyles that careers in agriculture and natural resources provide (example: locations, outdoor experiences, housing/living costs, etc.).
- Collaborate with schools, community organizations, and local businesses to organize site visits, job shadowing experiences, and internships that provide hands-on exposure to high priority occupations. Ensure that these opportunities are accessible to students from diverse backgrounds, including BIPOC students and students from rural areas.

**2. Support for Rural Programs:**

- Recognize the importance of rural areas as the lifeblood of industries within the agriculture and natural resource sectors. Allocate funding and resources to support programs specifically designed to serve rural communities and address their unique needs and challenges.
- Invest in technology and transportation to enhance access to education and training opportunities for rural learners. Provide financial assistance for students in rural areas to cover costs associated with participation in programs, such as transportation and materials.

**3. Exposure for Students and Parents, Particularly Spanish-speaking Communities:**

- Recognize the significance of family support in students' educational and career pathways. Provide program information and materials in Spanish to ensure accessibility for Spanish-speaking students and their parents.
- Host informational sessions and workshops conducted in Spanish to engage Spanish-speaking communities and provide them with resources and culturally-relevant guidance on pursuing high priority occupations in agriculture and natural resources. Collaborate with community leaders, school districts, and cultural organizations to reach Spanish-speaking families effectively.

#### 4. Promotion of Career Pathways:

- Increase awareness and understanding of career pathways within the sector among BIPOC students and students from rural areas. Develop marketing materials and online resources that highlight the opportunities available and showcase the successes of individuals from diverse backgrounds in the field, with a focus on Spanish-speaking and indigenous populations, each of which have deep historical knowledge of agriculture and natural resource work.
- Partner with schools and community organizations to integrate career exploration and preparation activities into existing curricula and extracurricular programs. Provide training for educators and counselors, built in partnership with BIPOC and rural communities, on how to support BIPOC and rural students in exploring and pursuing high priority occupations.

#### 5. Data Collection and Evaluation:

- Collect data on student participation and outcomes to track progress and identify areas for improvement. Analyze data to ensure that interventions are effectively reaching BIPOC students and students from rural areas and adjust strategies accordingly.
- Regularly evaluate programs to measure their impact on increasing participation and addressing equity gaps.

Several programs are exemplary in their efforts to increase participation of BIPOC students and students from rural areas in high priority occupations. For example, the Washington state MESA Community College Program (Mathematics, Engineering, Science Achievement) has a demonstrated history of delivering STEM education and support services to underrepresented individuals, including BIPOC students and those from rural areas. This program provides hands-on learning opportunities, mentorship programs, and resources for college readiness, aiding students in pursuing STEM careers. Presently, MESA operates in twelve out of the 34 community colleges in Washington, along with two collaborating universities. Expanding participation to encompass additional rural areas and schools offering STEM-related fields could serve as an effective strategy in bolstering support for a greater number of BIPOC and rural students. Similarly, the Rural Student Success Initiative (RSSI) supports rural schools and communities in the state of Texas by providing resources, training, and technical assistance to improve college and career readiness outcomes for rural students through county extension offices. Washington state could adopt the Rural Students Success Initiative (RSSI) similar to the model implemented in Texas. The initiative would be spearheaded by a Director and supported at the local level by part-time leadership coaches to offer ongoing guidance to county agents within the designated county extension sites. Each site may feature a local leadership team consisting of secondary and postsecondary leaders and community representatives. Co-led by the county extension agent and central staff, this team would collaborate to devise and execute strategies tailored to local needs. They would work closely with schools and community-based organizations to implement the Initiative's curricular framework, providing support to all students and parents from Grades 8 to 12. By adopting strategies similar to these programs and leveraging partnerships with stakeholders across the sector, we can increase participation and promote equity in high priority occupations for all students in Washington State.

**What overarching strategies do you recommend to support pathway development for the highest-priority occupations in your sector?**  
(2 pages max)

**1. Enhanced Career Exploration and Preparation Programs:**

- **K-12 Exposure:** Implement comprehensive career explore and prep programs within the K-12 education system to provide students with early exposure to opportunities in natural resources and agriculture. This may include implementing curriculum activities within the classroom, organizing field days and tours to provide students with interactive and hands-on experiences, facilitating internships, and offering ongoing mentorship opportunities with industry professionals.

In regions throughout the state, there are schools providing various career exploration opportunities related to local industries. For instance, there's Wheat Week in the Mid-Columbia and East region, Salmon Summit in the Mid-Columbia region, and statewide programs like YESS and Microsoft's Farm Beats. With numerous valuable exploration opportunities already available, there's a desire to expand their reach.

For example, rather than just one 10th grade class in a particular district or region utilizing the YESS program, the aim is to involve 10th grade classes across the entire district or region in the program. This expansion would enable more students to benefit from these valuable career exploration opportunities.

Feedback indicates that many students are still unaware of the wide range of career options available within the fields of agriculture and natural resources. It is imperative to generate interest in these areas before expanding launch programs to ensure their viability and attract significant enrollment.

- **Funding Support:** Advocate for increased funding and endorsements from Career Connect Washington to develop and sustain career explore, prep, and launch initiatives. This financial support can enable the expansion of existing programs and the creation of new programs to cater to diverse student interests and needs.

**2. Addressing Transportation Barriers:**

- **Utilization of Program Builder Funds:** Utilize available funds to address transportation barriers that hinder students' access to career explore and prep activities. This could ensure equitable participation regardless of geographical location or financial constraints.

**3. Utilizing Existing Frameworks:**

- **Integration of existing frameworks:** Integrate established frameworks related to natural resources, such as those offered by the Pacific Education Institute (PEI), into K-12 curriculum planning. By aligning educational content with industry standards and best

practices, educators can effectively introduce students to foundational concepts and skillsets essential for success in forestry/natural resources.

#### **4. Promotion and Support of Existing Programs:**

- **Partnerships and Collaboration:** Foster partnerships between educational institutions, industry stakeholders, and community organizations to promote and support existing programs in forestry, natural resources, and agriculture. By leveraging resources and expertise from multiple sectors, educational institutions can enhance program offerings, provide students with diverse learning opportunities, and facilitate seamless transitions to higher education or the workforce. Additionally, industry partners will have the opportunity to develop trust and buy in of CCW practices. In practice, this is ongoing work and conversations, keeping partners at the table as CCW further develops opportunities.
- **Industry Connections:** Strengthen connections between educational institutions and industry leaders to ensure program relevance and responsiveness to evolving industry needs. By engaging industry professionals in curriculum development, internship placements, and guest lectures, educational institutions can provide students with real-world insights and experiences, enhancing their employability and career readiness upon graduation. This effort would increase industry buy-in by soliciting input early on in program development, specifically encouraging educational institutions to develop partnerships in a sustainable, long-lasting manner.

#### **5. Agriculture Educator Externships:**

- **Professional Development Opportunities:** Offer an agriculture educator externship program to provide teachers with immersive learning experiences in the agriculture sector. Through site visits, workshops, and networking events, educators can gain firsthand knowledge of industry trends, emerging technologies, and career pathways, enriching their instructional practices and better preparing students for future success in the field.

#### **6. Centralized Information Hub:**

- **Comprehensive Resource Database:** Establish a centralized information hub to catalog current career explore, prep, and launch programs within forestry and agriculture. This online platform should provide detailed descriptions, contact information, and success stories for each program, serving as a valuable resource for students, educators, program builders, and industry partners seeking to explore or support pathways in these sectors.

By implementing these strategies stakeholders can collaborate effectively to support pathway development for the critical demand occupations in forestry and agriculture, empowering students to pursue rewarding and sustainable careers in these vital industries.

**Between now and June of 2025, how will you prioritize your time, attention, and resources as a sector leader to support regional pathway development and advance the recommendations above? What specific actions will you take?**

As sector leaders, our priority between now and June 2025 will be to support regional pathway development and advance the recommendations by staying connected with Regional Networks, facilitating collaboration, sharing resources, and promoting successful programs. Here's how we will prioritize our time, attention, and resources:

1. **Staying connected to Regional Networks:** We will maintain active communication with Regional Networks where overlap is most available. By participating in meetings and discussions, we will ensure alignment of priorities and identify areas where additional support is needed and where potential for collaboration is most robust.
2. **Quarterly Check-ins with Non-aligned Regional Networks:** For regions where the alignment is limited, we will conduct quarterly check-ins to understand and reevaluate shared priorities and foster collaboration as opportunities arise.
3. **Learning the Landscape of Successful Programs:** We will continue to explore successful programs in the field of agriculture and natural resources. This knowledge will be shared with others interested in creating similar programs, fostering innovation and efficiency across regions.
4. **Supporting Ongoing Efforts and Partnerships:** We will actively support existing initiatives and partnerships, such as the Tri-Cities Career STEM Academy and collaborations with organizations like PEI. Continuous support for projects undertaken by regional network partners will remain a priority.
5. **Identifying Partners for Agriculture Educator Externship Opportunity:** We plan to collaborate with partners to organize an externship program tailored for regional educators focused on agriculture careers and opportunities. Seeking guidance and expertise, we'll engage with the Maritime Sector Leader, who are in the process of conducting their own K12 Maritime externship and are crafting an open resource framework for the project, ensuring accessibility to any organization contemplating externship program establishment. This initiative will enhance educators' understanding of industry needs and facilitate the development of relevant curricula.
6. **Distributing Pathways to Excellence Guide:** We will ensure the distribution of the Pathways to Excellence guide in both English and Spanish at relevant events. This will provide stakeholders with valuable resources and information to support pathway development efforts.
7. **Utilizing Monthly Newsletter:** The monthly newsletter will serve as a key communication tool. We will highlight successful programs statewide, provide updates on Career Connect Washington funding opportunities, and promote upcoming regional events related to agriculture and natural resources.

By prioritizing these actions, we aim to foster collaboration, share best practices, and provide support to stakeholders involved in regional pathway development in agriculture and natural resources. Through these efforts, we can advance the recommendations and contribute to the growth and sustainability of the sector.